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ARCHITECTURE OF THERMAL POWER PLANTS IN YUGOSLAVIA

Architect Milica Sterlic, Belgrade

Thermal power plants in prewar Yugoslavia were designed and built by foreign firms. They were built solely for production purposes, with hot and dingy premises, not even basic sanitary facilities, and no indication of any desire to create favorable working conditions. Today, however, thermal power plants are built to provide maximum light, air, and sunshine, more sanitary facilities, recreation halls, and green lawns.

The construction site for a thermal power plant must be close to a coal mine, have a water supply, be close to transportation, be exposed to wind of a favorable direction and velocity, permit the laying of sufficient electric cables in the desired directions, be able to support the weight required, satisfy conditions for plant defense if necessary, permit future expansion, possess adequate surroundings, etc.

To accommodate a standard 150,000-kilowatt Yugoslav thermal power plant, a surface area of 270,000 square meters is needed. The main power-plant building is approximately 200 meters from the road, facing other industrial buildings. The stacks are free and located between boilerhouse and coalyard to insure direct connection between boilers and gas pipes, and that the wind carries smoke off over the coalyards. Approximately 30,000 square meters are occupied by the coalyard, which is 120 meters away from the main building. The site is to be selected so that coal dust will not be carried to the main and auxiliary buildings.

The current-distributing building is placed near outgoing cables and is well protected from coal dust. To give sufficient space for incoming and outgoing water ducts connecting the building housing the turbines with the refrigeration building, the current-distributing building is placed approximately 20 meters behind the machine room. The water-cooling towers are placed to insure the shortest possible connection of towers and turbines with ducts and pipes, and to facilitate additional supplies of river water. Selection of

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a power-plant site is also influenced by prevailing winds, to avoid freezing of current-distributing installations in winter. Railroad sidings connect all plant buildings and lead not only to the machine room, but also to the boiler-house, thus facilitating machinery installation.

The water-purification station is located close to the refrigeration building, and is connected by a railroad track with the siding of the current-distributing building. The repair shop and supply room are in the vicinity of the main power plant close to the railroad siding, to facilitate transportation of machinery directly from the main building to the repair shop.

Other auxiliary facilities such as the coal-servicing installations, coal-crushing machines, wire shop, oil reservoirs, and various supply rooms are placed so as best to serve their particular purposes. The administration building, with reception desk, workers' dining hall, and guest rooms, is located close to the main entrance. A network of roads connects all plant buildings, and unoccupied land is planted with trees.

In the main power plant of the standard Yugoslav thermal power plant, boilers are placed in a row; opposite each boiler are located the hoppers, pumps, turbines, and switchboards belonging to it. In this so-called block system, individual power units can be assembled and put in operation one at a time. This method provides regularity of form, sufficient visibility in the machine room, and easy access to each piece of machinery. The room is of considerable size, especially in width (up to 24 meters). Its height is 44.30 meters, which corresponds to the height of a 14-story building. These dimensions are determined by the size of machines, boilers, cranes, conveyers, and transport facilities.

The current-distributing building is located in front of the machine room and is connected with the technical-administrative building. The premises accommodating technical offices, laboratories, local repair shops, checkrooms, and shower rooms occupy a two-story building perpendicular to the row of machine rooms, providing the shortest possible line of communications.

The basic solution of the lighting problem was found in the use of continuous fluorescent tubes fixed above working places and on the ceiling. In addition, large glass surfaces in the walls give plenty of daylight. Parts of the building located between boilers get light through ventilation ducts. The most difficult problem was the lighting of the hopper area. However, since a concession was made at this point by the mechanical engineers, who agreed to cut the reservoir unit into two groups, the problem was solved quite adequately.

Exterior arrangements depend on the selected method of continuous lighting of the monolithic reinforced-concrete building elements, and type of roof selected. The main supporting pillars in all halls are placed 5.60 meters apart. This was determined by the space needed between machines and by economy, and on this basis all other building dimensions were determined.

A projecting roof, friezes, and an adequate type of window opening give the entire building a three-dimensional appearance. Selection of the proper type of well-baked tile, concrete pillars, eaves, and friezes contributes to construction durability.

The machine room and the current-distributing room are normally kept very clean and thus provide an opportunity for the utilization of various building materials and architectural styles. The architectural style of the main power-plant building is determined by electromechanical requirements, the shape of the building, the building materials used, and modern architectural principles. All other buildings are to be built in the same style. In planting green lawns on plant grounds in compliance with architectural principles, as in all stages of the project, the architect is motivated by the desire to create pleasant, happy, and aesthetic conditions for the future workers.

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